

REMARKS

In response to the final Office Action dated August 18, 2003, in connection with the above-identified application, the applicant respectfully requests entry of this amendment under the provisions of 37 C.F.R. § 1.116(a) in that the amendment and remarks below place the application and the claims in condition for allowance and in better form for consideration on appeal. Claims 1-31 are pending in this application. Claims 1-3, 5, 23-28 and 30 have been rejected under 35 U.S.C. §102. Claims 4, 6-22, 29 and 31 have been rejected under 35 U.S.C. §103. Upon entry of this amendment, claim 1 has been amended, claim 4 has been cancelled without prejudice and claims 32-38 have been added. No new matter has been added. Reexamination and reconsideration is respectfully requested.

Rejections Under 35 U.S.C. §102

The Examiner has rejected Claims 1-3, 5, 23-28 and 30 under 35 U.S.C. §102(b) as being anticipated by Otagawa et al., U.S. Patent #4,900,405. This rejection is respectfully traversed. However, to expedite prosecution of this application and pass the claims to allowance at an earliest possible date, Applicant has amended Claim 1.

As amended, Claim 1 now recites language previously found in Claim 4, which recited that, *inter alia*, “a layout of the first electrode and the second electrode minimizes cross coupling between the first electrode and the second electrode. This feature is not disclosed or suggested in Otagawa et al.

Otagawa et al. is directed toward electrode structures for analyzing gas and/or vapor mixtures. Otagawa et al. describes a first electrode, a second electrode and a reference electrode disposed on a substrate (Otagawa et al., Fig. 1, elements 18, 30 and 32, respectively) which are used for sensing electrochemical reactions. The thrust of Otagawa et al. is to position electrodes close enough together to create fast response times and to incorporate as many electrodes as possible on a substrate. Otagawa et al. is not directed toward the minimization of cross-coupling.

As can be seen in Fig. 1 of Otagawa et al., the first electrode and the second electrode are disposed adjacent each other while the reference electrode is disposed beneath the first electrode

and the second electrode. Moreover, each electrode pair in Otagawa et al. is disposed adjacent another electrode pair. Thus, the layout of the electrodes in Otagawa et al. is completely different than that claimed by Applicant in amended Claim 1.

In amended Claim 1, the reference electrode is disposed in between each electrode pair, separating the electrode pairs. In Otagawa et al., the reference electrodes do not separate electrode pairs and are not disposed in between electrode pairs. Rather, in Otagawa et al., the reference electrodes are disposed adjacent the other reference electrodes.

Also, in amended Claim 1, the first electrode separates the reference electrode and the second electrode. In Otagawa et al., the first electrode is disposed directly adjacent the second electrode with the reference electrode disposed beneath the first and second electrode. The reference electrode in Otagawa et al. is not separated from the second electrode by the first electrode.

Thus, there are features claimed by Applicant in amended Claim 1 that are not disclosed or suggested by Otagawa et al. Accordingly, Claim 1 cannot be anticipated by Otagawa et al. Likewise, Claims 2, 3, 5, 23-28 and 30, which depend either directly or indirectly from Claim 1, are allowable for at least the same reasons as Claim 1.

Applicant has added new dependent Claims 32-38. New dependent Claims 32-38 find support in the application as originally filed and recite additional features of embodiments of Applicant's invention that clarify and distinguish over the cited art. New dependent Claims 32-38 depend either directly or indirectly from Claim 1 and are allowable for at least the same reasons as Claim 1.

Moreover, new dependent Claims 32-38 recite additional features not disclosed or suggested in Otagawa et al. For example, new dependent Claim 32 recites at least two electrode pairs, each electrode pair having a first electrode and a second electrode; and a reference electrode, wherein the reference electrode is disposed between and separates the at least two electrode pairs, and wherein the first electrode of each of the at least two electrode pairs separates the reference electrode and the second electrode of each of the at least two electrode pairs. New dependent Claim 33 recites that the reference electrode is rectangular. New dependent Claim 34

recites that the second electrode is rectangular. New dependent Claim 35 recites that the reference electrode is perpendicular to the second electrode. New dependent Claim 36 recites that the second electrode is disposed within the boundaries of the first electrode. New dependent Claim 37 recites that the second electrode is substantially parallel with at least one leg of the first electrode. New dependent Claim 38 recites that the reference electrode is disposed perpendicularly to the second electrode of each of the at least two electrode pairs. These features are not disclosed or suggested in Otagawa et al. Thus, for at least these additional reasons, Claims 32-38 are allowable over in Otagawa et al.

Rejections Under 35 U.S.C. §103

The Examiner has rejected Claims 4, 6-22, 29 and 31 under 35 U.S.C. §103. In particular, the Examiner has rejected Claims 4 and 31 under 35 U.S.C. §103(a) as being unpatentable over Otagawa et al. in view of Kespohl, U.S. Patent #5,394,095; Claims 6 and 20-22 over Otagawa et al. in view of Schulman et al., U.S. Patent #6,387,048; Claims 7, 8, 10, 13 and 19 over Otagawa et al. in view of Preikschat, U.S. Patent #3,992,665; Claims 9 and 18 over Otagawa et al. and Preikschat in view of Schulman et al.; Claims 11 and 12 over Otagawa et al. and Preikschat and further in view of Jones, U.S. Patent #4,533,986; Claims 14 and 15 over Otagawa et al. and Preikschat and further in view of Gord et al, U.S. Patent #5,999,848; Claims 16 and 17 over Otagawa et al. and Preikschat and Gord et al and further in view of Niezgoda et al, U.S. Patent #4,333,377; and Claim 29 over Otagawa et al. in view of Shiraki et al, U.S. Patent Publication #US 2003/0057970. These rejections are respectfully traversed. Claims 4, 6-22, 29 and 31, as well as new dependent Claims 32-38, depend either directly or indirectly from independent Claim 1. However, as stated above in connection with the rejections under 35 U.S.C. §102, to expedite prosecution of this application and pass the claims to allowance at an earliest possible date, Applicant has amended independent Claim 1.

As stated above, as amended, Claim 1 now recites an electronic circuit for sensing an output of a sensor, the electronic circuit comprising, *inter alia*, at least two electrode pairs, each electrode pair having a first electrode and a second electrode; and a reference electrode, wherein

the reference electrode is disposed in between and separates the at least two electrode pairs, and wherein the first electrode of each of the at least two electrode pairs separates the reference electrode and the second electrode of each of the at least two electrode pairs. These features are not disclosed or suggested, individually or in combination, in Otagawa et al., Kespohl, Schulman et al., Preikschat, Jones, Gord et al; Niezgoda et al, or Shiraki et al.

As stated above Otagawa et al. does not disclose or suggest the features of amended Claim 1. Moreover, Kespohl does not disclose or suggest the features of amended Claim 1. Kespohl is directed toward a sensor device for a noncontact sensor that controls moving strips of conductive material. Kespohl describes an electrode configuration wherein a first electrode (2) within the boundary of a second electrode (3) is *adjacent* a reference electrode (7). (See Kespohl, Fig. 5). There is no disclosure or suggestion in Kespohl of a second electrode that is separated from a reference electrode by a first electrode as claimed by Applicant in amended Claim 1. In addition, Kespohl describes an electrode configuration wherein a reference electrode (7) exists simultaneously within the boundary of the electrode pairs and does not separate the electrode pairs. There is no disclosure or suggestion in Kespohl of a reference electrode that is disposed in between and separates electrode pairs as claimed by Applicant in amended Claim 1.

In addition, the Examiner cited Kespohl for the teaching that a U-shape is generally practiced in the art for minimizing interferences and cross-coupling. However, the cited sections of Kespohl only describe that “this sort of interference can be prevented by providing shielding electrodes 3 and 4 [sic, 5 corrected] whereby further capacitances are created between the electrode pairs 2 and 3 and also 4 and 5” (see col. 4, lines 29-32). However, the reason the shielding electrodes 3 and 5 are U-shaped (or C-shaped as described in Kespohl) is because the electrodes 2 and 4 themselves are U-shaped. The shielding electrodes 3 and 5 are solely described for creating a separate capacitance which would prevent a person (or other outside forces) from having an interfering influence on an unshielded detector electrode 2 because the person is typically at ground potential (see col. 4, lines 17-28). Kespohl does not describe, teach, or suggest how to create a layout to prevent cross coupling between two electrodes on the same circuit as claimed.

Schulman et al. also does not disclose or suggest the features of amended Claim 1.

Schulman et al. is directed toward an implantable sensor. The sensor may be used for glucose measurements. In Schulman et al., electrodes including a working electrode, a counter electrode and a reference electrode may be disposed on a substrate. (Schulman et al., col. 8, ll. 31-52; fig. 4C.) However, Schulman et al. does not describe electrode layout or configuration, other than to say that “a plurality of electrodes are arranged in a suitable pattern.” (Schulman et al., col. 8, ll. 46-47.). Schulman et al. does not disclose or suggest an electronic circuit comprising, *inter alia*, at least two electrode pairs, each electrode pair having a first electrode and a second electrode; and a reference electrode, wherein the reference electrode is disposed in between and separates the at least two electrode pairs, and wherein the first electrode of each of the at least two electrode pairs separates the reference electrode and the second electrode of each of the at least two electrode pairs as claimed by Applicant

Preikschat also does not disclose or suggest the features of amended Claim 1. Preikschat is directed toward an electrical impedance measuring apparatus. Preikschat includes a single electrode 12. Preikschat does not disclose or suggest an electronic circuit comprising, *inter alia*, at least two electrode pairs, each electrode pair having a first electrode and a second electrode; and a reference electrode, wherein the reference electrode is disposed in between and separates the at least two electrode pairs, and wherein the first electrode of each of the at least two electrode pairs separates the reference electrode and the second electrode of each of the at least two electrode pairs as claimed by Applicant.

Jones also does not disclose or suggest the features of amended Claim 1. Jones is directed toward a power supply and does not contemplate electrodes. Thus, Jones does not disclose or suggest an electronic circuit comprising, *inter alia*, at least two electrode pairs, each electrode pair having a first electrode and a second electrode; and a reference electrode, wherein the reference electrode is disposed in between and separates the at least two electrode pairs, and wherein the first electrode of each of the at least two electrode pairs separates the reference electrode and the second electrode of each of the at least two electrode pairs as claimed by Applicant.

Gord also does not disclose or suggest the features of amended Claim 1. Gord is directed toward daisy chainable sensors and stimulator for implantation in living tissue. Gord does not describe electrode layouts. Thus, Gord does not disclose or suggest an electronic circuit comprising, *inter alia*, at least two electrode pairs, each electrode pair having a first electrode and a second electrode; and a reference electrode, wherein the reference electrode is disposed in between and separates the at least two electrode pairs, and wherein the first electrode of each of the at least two electrode pairs separates the reference electrode and the second electrode of each of the at least two electrode pairs as claimed by Applicant.

Niezgoda et al also does not disclose or suggest the features of amended Claim 1. Niezgoda et al is directed toward a tone generation system and does not contemplate electrodes. Thus, Niezgoda et al does not disclose or suggest an electronic circuit comprising, *inter alia*, at least two electrode pairs, each electrode pair having a first electrode and a second electrode; and a reference electrode, wherein the reference electrode is disposed in between and separates the at least two electrode pairs, and wherein the first electrode of each of the at least two electrode pairs separates the reference electrode and the second electrode of each of the at least two electrode pairs as claimed by Applicant.

Shiraki et al. also does not disclose or suggest the features of amended Claim 1. Shiraki et al. is directed toward a liquid component analyzer. Shiraki et al. includes a potential difference measurement plate 4 and terminals 40A-40F that work in conjunction with probes P1-P6 for making electrochemical measurements. The probes P1-P6 are disposed adjacent one another and all are disposed on the potential difference measurement plate 4. Each of the probes P1-P6 is connected to a terminal 40A-40F. (See Shiraki et al., Fig. 5.) This configuration is different than that claimed by Applicant. Shiraki et al. does not disclose or suggest an electronic circuit comprising, *inter alia*, at least two electrode pairs, each electrode pair having a first electrode and a second electrode; and a reference electrode, wherein the reference electrode is disposed in between and separates the at least two electrode pairs, and wherein the first electrode of each of the at least two electrode pairs separates the reference electrode and the second electrode of each of the at least two electrode pairs as claimed by Applicant.

Thus, there are features claimed by Applicant in amended Claim 1 that are not disclosed or suggested by Otagawa et al., Kespohl, Schulman et al., Preikschat, Jones, Gord et al; Niezgoda et al, or Shiraki et al., individually or in combination. Accordingly, a *prima facie* case of obviousness has not been made over Claim 1 with respect to these references. Claim 1 is, thus, allowable over these references. Likewise, Claims 4, 6-22, 29 and 31, which depend either directly or indirectly from Claim 1, are allowable for at least the same reasons as Claim 1. Moreover, new dependent Claims 32-38 depend either directly or indirectly from Claim 1 and are allowable for at least the same reasons as Claim 1.

Applicant respectfully submits that the foregoing amendments are made to comply with requirements of form, and thus may be admitted under 37 C.F.R. § 1.116(a). With respect to those amendments deemed to touch the merits, admission is requested under 37 C.F.R. § 1.116(b). In this connection, the amendments were not earlier presented because they are in response to the matters pointed out for the first time in the Final Office Action. Lastly, admission is requested under 37 C.F.R. § 1.116(a) as presenting the rejected claims in better form for consideration on appeal.

Therefore, Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 50-0872. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 50-0872. If any extensions of time are needed for timely acceptance of papers

submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 50-0872.

Respectfully submitted,

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